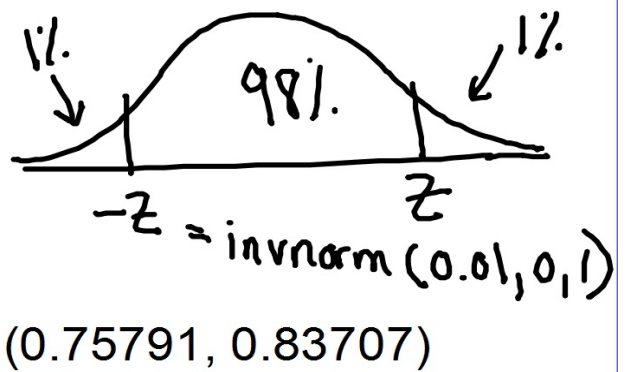


worksheet #1

$$1) (a) \hat{p} = \frac{445}{558} = 0.7975$$

$$\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$



We are 98% confident that the true percent of bullied students is between 75.79% and 83.71%.

1) (b)

①

$H_0: p = 0.75$

$H_a: p > 0.75$ \neq

②

$$Z = \frac{\hat{p} - P}{\sqrt{\frac{P(1-P)}{n}}} = 2.591$$

③

$$P(Z > 2.591) = 0.0048$$

$$\text{normcdf}(2.591, \infty, 0, 1)$$

④

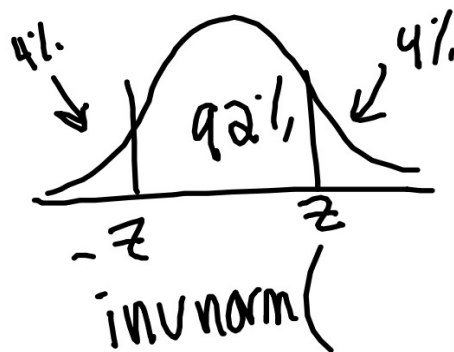
- We reject H_0 b/c p-value of 0.0048 is $< \alpha = 0.05$.
- We have sufficient evidence that the true percent of students who are bullied is greater than 75%.

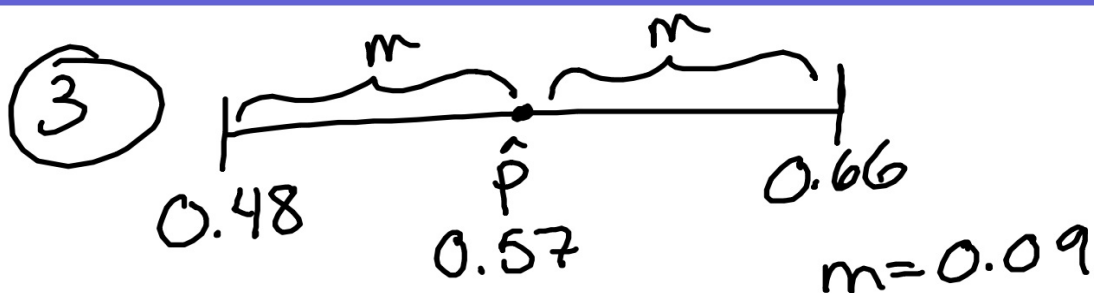
$$\textcircled{2} \quad \hat{p} \pm \underbrace{z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}}_{\text{margin of error}}$$

$$m = z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$0.04 = 1.75 \sqrt{\frac{(0.57)(0.43)}{n}}$$

$$n = 470$$





④ $n = 150$
 $z^* = ?$

$$0.09 = z^* \sqrt{\frac{(0.57)(0.43)}{150}}$$

$$0.09 = z^* \cdot 0.0404$$

$$z^* = 2.2277$$

$$2.228$$

$$\text{Normcdf}(-2.228, 2.228, 0, 1)$$



$$97.412\%$$

⑤ reject @ $\alpha=0.05$.

p-value < 0.05

0.03

0.0003

maybe

⑥ reject @ $\alpha=0.01$.

p-value < 0.01

0.005

$$\textcircled{7} \text{ a) } \hat{p} = \frac{726}{6853}$$

$$\hat{p} \pm z * \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = (0.09865, 0.11323)$$

We are 95% confident that the true % of smokers is btw. 9.87% and 11.32%.

$$b) \hat{p} = \frac{726}{6853} = 0.106$$

$$\textcircled{1} \boxed{H_0: p = 0.112}$$
$$H_a: p \neq 0.112$$

$$\textcircled{2} z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} = -1.591$$

$$\textcircled{3} 2 \cdot P(Z < -1.591) = 0.1116 > \alpha = 0.05$$

$\textcircled{4}$

HW:
Worksheet #2
1, 3, 5

$$m = z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$